

REMARKS

No new matter is believed to be added to the application by this Amendment.

Status of the Claims

Claims 1, 3, 5, 7, 9, 11, 13, 15, 17, 19-32 and 37-57 are pending in the application. Claims 19-32 and 37-40 have been withdrawn from consideration by the Examiner. Claims 1, 3, 5, 7, 9, 11, 13, 15, 17 and 41-54 are rejected. Claims 55-57 are new. Support for the amendments to claims 1, 47 and 52 can be found at page 17, lines 17-18, page 19, lines 14-16 and page 33, lines 1-2 of the specification. Support for newly added claim 55 can be found at page 15, line 15 of the specification. Support for newly added claim 56 can be found at page 26, line 16 of the specification. New claim 57 sets forth subject matter cancelled from claim 1.

Rejection Under 35 U.S.C. 102(b) over Imoto (Paragraphs 2-4 of the Office Action)

Claims 1, 3, 7, 9, 11 and 47-51 are rejected under 35 U.S.C. 102(b) as being anticipated by Imoto (U.S. Patent No. 5,497,445). Applicants traverse this rejection and respectfully request reconsideration and withdrawal thereof.

The Present Invention and its Advantages

An object of the organic waveguide of the invention is to permit the organic waveguide to be integrated with other optical elements on a single substrate. This object of the invention is achieved by forming the clad section, which is an inorganic dielectric, by sputtering, by CVD or by vapor deposition. See new claim 57.

The technology of the invention permits the clad section to have substantially the same shape as the core section such that the thickness of the clad section becomes even over the entire area of the substrate. As a result, the organic waveguide can be easily connected, i.e., integrated, with other optical elements on a single substrate.

In order to better set forth this distinguishing characteristic of the invention, independent claims 1, 47 and 52 have been amended to recite "the clad section has substantially the same shape as the core section". Also, the clad section can have a thickness of several microns, as is set forth in new claim 55. Particularly the clad section can have a thickness of about 2 microns, as is set forth in new claim 56. As a result, the present invention, as is instantly claimed, has features which are neither disclosed nor suggested by the prior art.

Distinctions of the Invention over Imoto

Imoto pertains to a polymer core optical waveguide which includes a substrate, a buffer layer, a polymer core section and a clad section having a lower refractive index than the core section. Figure 5 of Imoto shows a wide cladding layer 5 over a small core layer 3. Imoto stresses that the cladding layer and the core layer not be in conformance and at column 6, lines 39-42 states "In the structure, since the polymer core layer 3 and the polymer cladding layer 5 do not contact each other in a wide area, the cracking due to occurrence of stress hardly takes place".

Imoto fails to disclose or suggest "the clad section has substantially the same shape as the core section" such as is set forth in instant claims 1, 47 and 52. As noted above, Imoto believes that the wide contact that would result from the configuration of the invention would be highly disadvantageous.

As a result, the teachings of Imoto fail to anticipate the instantly claimed invention and additionally would fail to suggest the present invention by teaching away from its claimed embodiments. Accordingly, this rejection is overcome and withdrawal thereof is indicated.

Rejection Under 35 U.S.C. 103(a) Over Imoto in View of Tabuchi
(Paragraphs 5-7 of the Office Action)

Claims 52-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imoto in view of Tabuchi (U.S. Patent No. 6,112,002). Applicants traverse this rejection and respectfully request reconsideration and withdrawal thereof.

Tabuchi fails to address the deficiencies of Imoto in suggesting an embodiment of the present invention.

As discussed above, Imoto neither discloses nor suggests an embodiment of the present invention for "the clad section is substantially the same shape as the core section." Further, Imoto teaches away from this embodiment because of the large contact area between the core and clad. As a result, Imoto fails to be utilizable as the basis of a *prima facie* case of obviousness.

The Examiner turns to Tabuchi for teachings pertaining to an optical waveguide in an optical element on a common substrate. However, Tabuchi fails to address the deficiencies of Imoto in teaching or suggesting that the clad section is substantially the same shape as the core section. As a result, a person having ordinary skill in the art would not be motivated to combine Tabuchi and Imoto to produce the claimed embodiment of the invention. Therefore, a *prima facie* case of obviousness has not been made. Accordingly this rejection is overcome and withdrawal thereof is indicated.

Rejection Under 35 U.S.C. 103(a) over Imoto in view of Thomas
(Paragraph 8 of the Office Action)

Claim 5 is rejected under 35 U.S.C. 103(a) as being obvious over Imoto in view of Thomas (U.S. Patent 5,235,663). Applicants traverse this rejection and respectfully request reconsideration and withdrawal thereof.

Thomas fails to address the deficiencies of Imoto in suggesting a claimed embodiment of the invention.

The Examiner turns to Thomas for teachings pertaining to surrounding a core and clad section with a light shielding film. However, Thomas fails to address the inability over Imoto to suggest "the clad section is substantially the same shape as the core section" as is set forth in independent claim 1 (upon which claim 5 depends). As a result, the combination of Thomas with Imoto is insufficient to allege *prima facie* obviousness over claim 5. Accordingly, this rejection is overcome and withdrawal thereof is indicated.

Rejection Under 35 U.S.C. 103(a) Over Imoto in View of Maruo
(Paragraph 9 of the Office Action)

Claims 13, 15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imoto in view of Maruo (U.S. Patent No. 5,572,619). Applicants traverse this rejection and respectfully request reconsideration and withdrawal thereof.

Maruo fails to address the deficiencies of Imoto in suggesting a claimed embodiment of the present invention.

Maruo pertains to polyimide materials for optical waveguides, including fluorinated polyimides. In Maruo, both the core and the cladding are made from polyimides. The adhesive taught by Maruo is for sandwiching polyimide components. The sandwich structure of Maruo is shown in Figure 2 of this patent, and sets forth a core and cladding structure which is fundamentally different from that of the present invention, where the clad section has substantially the same shape as the core section.

Maruo teaches away from the present invention. Maruo at column 8, lines 37-42 states "Furthermore, as the means for forming an embedded channel waveguide, the core layer film can be sandwiched by polyimide films which will become claddings, and these components can be compressed or adhere through thin adhesive agent layers." That is, Maruo fails to teach how to promote adhesion between the polyimide and the inorganic dielectric. That is, Maruo can be considered to teach away from using an inorganic material as cladding.

As has been shown, the teachings of Maruo and Imoto would fail to motivate a person having ordinary skill in the art to produce a claimed embodiment of the invention. Indeed, both Maruo and Imoto separately teach away from the instantly claimed invention. As a result, a *prima facie* case of obviousness has not been made over

the combination of Maruo and Imoto. Accordingly, this rejection is overcome and withdrawal thereof is indicated.

Conclusion

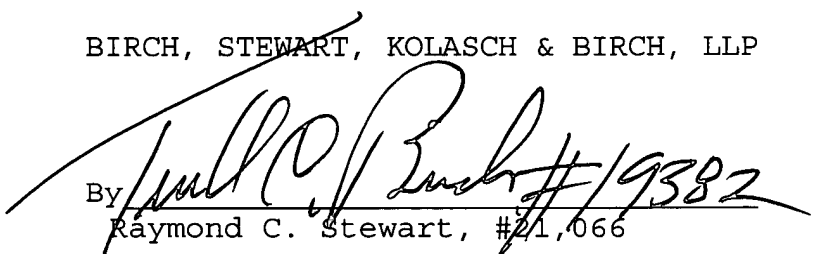
Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Robert E. Goozner, Ph.D. (Reg. No. 42,593) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.


Attached hereto is a marked-up version of the changes made to the application by this Amendment.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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Attachment: Version with Markings to Show Changes Made

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

The claims have been amended as follows:

1. (Three Times Amended) An organic waveguide comprising:

a substrate;

a buffer layer over the substrate;

a core section over the buffer layer, the core section being made of organic polymer; and

a clad section covering an upper surface of the core section and made of inorganic dielectric having a lower refractive index than that of the core section, and the clad section [being formed by sputtering, CVD or vapor deposition.] has substantially the same shape as the core section.

47. (Amended) An organic waveguide comprising:

a substrate;

a buffer layer over the substrate;

a core section over the buffer layer, the core section being made of organic polymer; and

a clad section covering an upper surface of the core section and made of inorganic dielectric having a lower refractive index than that of the core section, and the clad section has substantially the same shape as the core section.

52.(Amended) An optical part, which comprises:

an organic waveguide; and

an optical element selected from the group consisting of a photo-emitting element, a photo-receptive element and a lens, wherein the organic waveguide and the optical element are formed on a single substrate,

and the organic waveguide comprises:

a buffer layer over the substrate;

a core section over the buffer layer, the core section being made of organic polymer; and

a clad section covering an upper surface of the core section and made of an inorganic dielectric having a lower refractive index than that of the core section, and the clad section has substantially the same shape as the core section.

Claims 55-57 have been added.